Massachusetts Department of Environmental Protection
Source Water Assessment Program (SWAP) Report
for
American Institute for Economic Research

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program

Date Prepared:
October 14, 2003

Table 1: Public Water System (PWS) Information

PWS Name	**American Institute for Economic Research**
PWS Address	**P.O. Box 1000, Division Street**
City/Town	**Great Barrington, Massachusetts**
PWS ID Number	**1113028**
Local Contact	**Mr. Frederick Harwood**
Phone Number	**413-528-1216**

Well Name	*Source ID#*	*Zone I (in feet)*	*IWPA (in feet)*	*Source Susceptibility*
Spring	1113028-01G	343	467	Moderate

Introduction

We are all concerned about the quality of the water we drink. Groundwater sources may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:
This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

American Institute for Economic Research (AIER) is a facility located in the northeast corner of Great Barrington in south Berkshire County. The facility consists of several buildings that include office space and a small printing operation to publish their literature. The regular staff population is approximately 30 people per day but AIER also conducts seminars and is staffed by student interns. The facility is presently served by a single potable supply spring source (1113028–01G) located north of the facility in Alford. Periodically the spring source has inadequate yield to satisfy the water requirements at AIER. Under those conditions the facility used untreated water from the

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

adjacent Housatonic Water Company's Long Pond Reservoir. The intake for AIER was prior to the Housatonic Water Company's treatment facility and therefore, the Department has prohibited the use of untreated water from Long Pond. Prompted by the inadequate supply from the spring and the determination, through microscopic particulate analysis (MPA), that the spring source was under the influence of surface water and would require treatment, AIER is pursuing development of a new well source. At the time this report was prepared, the new source permitting process was near completion. Once that source (Well #1) is approved to come on-line, this report will be updated to include Well #1.

The Zone I for a spring is a square area while the Interim Wellhead Protection Areas (IWPA) is a radial area centered on the source. The size of the protection areas are calculated based on the measured or estimated volume if water used from the source. The estimated daily water use at the facility is 3,000 gallons per day. The length of the sides of the square Zone I area is 343 feet while the radius of the IWPA around the spring is 467 feet. The entire Zone I and IWPA area is forested with no other land use activities. All spring sources are considered to be vulnerable to activities on the land surface and all springs are considered to be subject to influence of surface water. You may request additional, current information regarding the quality of the water, from the local contact listed in Table 1. Please refer to the attached maps of the Zone I and IWPA and Table 2 for additional assessment information.

2. Discussion of Land Uses in the Protection Areas

There are few land uses and activities within the drinking water supply protection areas that are potential sources of contamination. The physical nature of the spring source makes it susceptible to natural microbial contaminants.

Key issues include:

1. **Wildlife/Natural microbial activity**

The spring is located in an aquifer with a high vulnerability to contamination due to the absence of a significant hydrogeologic barrier to prevent contaminant migration. The overall ranking of susceptibility to contamination for the spring is moderate, based on the presence of one moderate to high ranking threat land use or activity in the IWPA, as seen in Table 2.

1. Wildlife/Natural microbial activity – Though the area is relatively remote, the spring source was determined to be under the influence of surface water and therefore vulnerable to microbial contamination. Wild animals, farm animals and domestic pets can be carriers of waterborne diseases such as *Giardia*, *Cryptosporidium*, *Salmonella*, etc. Microorganisms are microscopic creatures such as bacteria, viruses, and protozoa. Because some microorganisms are known pathogens, or disease causing agents, microbial contamination of public drinking water supplies poses a serious threat to human health.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Wildlife	Yes	Yes	Moderate	The potential threat to this source is from natural sources and not anthropogenic land use.

- **-For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.**

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Some known contaminants of concern in drinking water include: Bacteria, Escherichia coli (E.coli), Viruses, and Protozoa. Bacteria, viruses, and protozoa when ingested in drinking water can cause a number of infectious waterborne diseases such as cholera, typhoid, hepatitis, and infectious gastrointestinal diseases like cryptosporidiosis and giardiasis. Symptoms of waterborne disease may include fever, fatigue and weight loss (common in viral cases), vomiting, abdominal cramping, diarrhea, and stomachaches. In the most severe cases waterborne diseases can prove lethal.

Recommendations:

- ✓ Some microbial contaminants can be removed by water treatment coagulation and filtration processes. Disinfection has been proven effective against bacteria and viruses, but protozoa, such as Cryptosporidium, are very resistant to chlorination alone. Other treatment methods are necessary to address Cryptosporidium such as ozonation, UV disinfection, or filtration.
- ✓ Continue the process of development of the new well.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the spring's susceptibility to contamination. The American Institute for Economic Research is commended for current protection measures including the active search to locate a new water source.

Please review and adopt the key recommendations listed above and as follows:

Zone I and IWPA:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I. Look for evidence of unauthorized access.
- ✓ Monitor activities and if there is evidence of increased activity or access, consider fencing and gating the immediate area around the spring.

Facilities Management:

- ✓ Concrete protective seals on the spring (earthen or concrete) should slope away from the source and surface runoff should be directed around the spring.

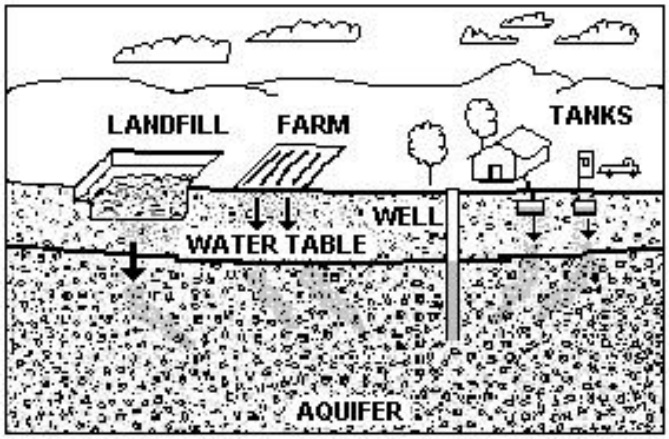

Figure 1: Example of how a well could become contaminated by different land uses and activities.

Planning:

- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact Sheet